

RECEIVED
CENTRAL FAX CENTER
DEC 11 2006

REMARKS

The Applicant has filed the present Amendment in reply to the outstanding Office Action of September 19, 2006, and Applicants believe the Amendment to be fully responsive to the Office Action for the reasons set forth below.

In the Office Action, Claims 6-14 were considered allowable subject matter if rewritten in independent form. Claim 1 was rejected under 35 U.S.C. §112, second paragraph as indefinite in that the Examiner has stated the phrase "the inlet plane" is unclear.

Via this Amendment Claim 1 has been amended for clarification to clarify that the inlet plane refers to the cryopump inlet plane. Additionally, Claims 1 and 2 have been amended to clarify that essentially all of the surface of the last stage cryopanel lies in a plane that intersects the plane with the tubes pitched parallel to the coldest pulse tube.

Additionally, Claims 1-5, and 5-17 were rejected under 35 U.S.C. §103(a) as directed to subject matter that is allegedly rendered obvious by U.S. Patent No. 4,679,401 to Lessard (hereinafter "Lessard") in view of U.S. Patent No. 6,293,109 to Miyamoto, *et al.* (hereinafter "Miyamoto"). Claims 1-5, and 15-18 were rejected under 35 U.S.C. §103(a) as directed to subject matter that is allegedly rendered obvious by U.S. Patent No. 4,966,016 to Bartlett (hereinafter "Bartlett") in view of Miyamoto. Claims 16 and 17 were rejected under 35 U.S.C. §103(a) as unpatentable allegedly rendered obvious by Lessard or Bartlett in view of Miyamoto and further in view of U.S. Patent No. 4,791,791 to Flegal, *et al.* (hereinafter "Flegal").

The Examiner stated that Lessard discloses a cryopump with the coldest cryopumping surface in a plane that intersects the plane of the coldest cooling tube with the exception that a

pulse tube cooler is not used. The Examiner relies on Miyamoto for this feature and concludes that it would have been obvious to one skilled in the art at the time of invention to modify the cryopump of Lessard by applying it to a pulse tube.

Applicants respectfully traverse this rejection and request their withdrawal in view of the reasons, arguments, and evidence presented in the paragraphs that follow.

Applicants respectfully disagree with the Examiner's allegations pursuant to 35 U.S.C. §103(a), and as a consequence, Applicant proffers the following arguments directed to patentability of the claimed invention.

In traversing the rejection of Claims 1-5 and 15-17 pursuant to 35 U.S.C. §103(a), the Applicant respectfully submits that the Lessard and Miyamoto combination is deficient in that it fails to teach or suggest the present invention.

In order for a rejection of claims to stand and a patent to be denied under 35 U.S.C. §103, the prior art must be such that the subject matter of the present application as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.

The Examiner's attention is directed to paragraphs 0006 and 0007 of the present application where there is an extensive discussion of the differences between a pulse tube expander and a GM expander. A GM expander can be operated in any orientation. A single stage pulse tube that operates about 60 K has small losses if the hot end of the pulse tube is not above the cold end, but the hot end of a two-stage pulse tube that is near 15 K must be within about 30° C of being above the cold end to avoid convective losses. The present invention describes pulse tubes where the warm ends of the pulse tubes are above the cold ends. Unlike the

present invention, Miyamoto teaches single stage pulse tubes with the warm ends of the pulse tube below the cold ends.

In traversing the rejection of Claims 1-5 and 15-18 pursuant to 35 U.S.C. §103(a), the Applicant respectfully submits that the Bartlett and Miyamoto combination is deficient in that it fails to teach or suggest the present invention.

Bartlett is directed to two separate expanders cooling the first and second stage cryopanel. The present invention, on the other hand, teaches pulse tube expanders having separate regenerators and pulse tubes for cooling the first and second stage cryopanel which are interconnected at the warm ends of the pulse tubes in order to use "interphase" control to minimize the size of the buffer volume. This interconnection is shown in Figures 1A-C, 2, 3A-C, and 4 of the present invention. Therefore, these claims cannot be rendered obvious by the combination of Bartlett and Miyamoto.

In traversing the rejection of Claims 16 and 17 pursuant to 35 U.S.C. §103(a), the Applicant respectfully submits that the Lessard, Bartlett, Miyamoto, and Flegal combination is deficient in that it fails to teach or suggest the present invention.

Claim 16 and Fig. 1C teach that the second stage cryopanel is a flat plate that is only folded, but has different pitches. These are easier to construct than the circular spun panels of Bartlett and Flegal. Moreover, the flat panels of Flegal are riveted together to approximate a cone.

Additionally, none of these references cited are directed to the object of the present invention to provide an arrangement of the tubes within the cryopump housing that facilitates the fabrication and instillation of cryopanel. None of the references are directed to pulse tubes and

regenerators located in a common plane in the center of the cryopump housing together with cold panels in planes pitched parallel to the plane of the tubes, thereby allowing the cryopanel to be mounted more easily.

The present invention is based on Applicant's own surprising discovery of an arrangement of the tubes within a cryopump housing that facilitates the fabrication and installation of the cryopanel.

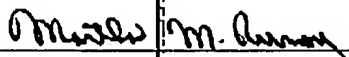
Thus, there would be no motivation whatsoever to combine these references as suggested by the Examiner. Nor does the combination lead to the present invention for at least the reasons cited hereinabove. However Lessard, Bartlett, Miyamoto, and Flegal may be combined, they do not make the invention obvious. None of the cited references suggest in any manner the improved arrangement of the present invention with the pulse tubes and regenerators located in a common plane in the center of the cryopump housing, and second, the cold panels are in planes that are pitched parallel to the plane with the tubes, i.e. a line can be drawn on a cryopanel surface that is parallel to the line where the plane of the tubes intersects the inlet plane).

Applicant accordingly maintains that the invention of Claims 1-12 is novel and inventive, and is not made obvious by the cited references.

In view of the remarks set forth above, this application is in condition for allowance, which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,



Martha M. Rumore
Reg. No. 47,046
(212) 940.6566

CUSTOMER NUMBER 026304

Docket No.: SHI 19.325 (310010-00104)

MMR:bf